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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,230	02/19/2004	Jian Yao	RB-176	5194

41245 7590 03/29/2007  
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EXAMINER
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AZARIAN, SEYED H

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/782,230		YAO ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Seyed Azarian		2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 11 and 13-16 is/are rejected.
- 7) ☒ Claim(s) 9 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/19/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-8, 10-11 and 14-16, are rejected under 35 U.S.C. 102(e) as being anticipated by Paragios et al (U.S. patent 7,139,409).

Regarding claim 1, Paragios a method for detecting shadow regions in an image, the steps comprising, (column 9, lines 53-57, capturing shadow);

a) providing an original image (Fig. 1, column 4, lines 37-51, refer to input image);

b) modeling said image as a reliable lattice (RL) (column 5, lines 13-44, detection models and a finite 2D lattices);

c) determining a relationship between said RL model and an Markov (MRF) model (column 3, lines 13-28, Mrkov Random field-based approach where information from different sources (background subtraction, intensity and modeling));

d) applying region level verification to said MRF model (column 8, lines 38-63, uses a fully connected Markov chain for each region);

e) identifying shadow regions in said original image from said MRF model (column 4, lines 52-63, detection step is obtained using Markov Random field based,

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also column 9, lines 42-57, system of Markov network demonstrating the arrival of a train affects the observed intensities of platform next to the train line as well as “shadows”).

Regarding claim 2, Paragios the method for detecting shadow regions in an image as recited in claim 1, wherein said original image is a single, static image (see claim 1, also column 4, line 63 through column 5, line 3, pixels in the current frame that are labeled as static pixels in an updating step).

Regarding claim 3, Paragios the method for detecting shadow regions in an image as recited in claim 2, wherein said single, static image is illuminated by substantially a single point illumination source (column 4, lines 26-36, the illumination conditions are characterized by near static situations).

Regarding claim 4, Paragios the method for detecting shadow regions in an image as recited in claim 2, wherein said single point illumination source is the sun (column 9, lines 53-64, refer to global illumination).

Regarding claim 6, Paragios the method for detecting shadow regions in an image as recited in claim 1, wherein said modeling said image as an RL step (b) comprises the sub-step of modeling an initial RL (Fig. 3A column 9, lines 19-40, each region is initialized with a local model).

Regarding claim 7, Paragios the method for detecting shadow regions in an image as recited in claim 6, wherein said modeling said image as an RL step (b) further comprises the sub-step of updating said initial RL (column 4, line 63 through column 5, line 4).

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Regarding claim 14, Paragios the method for detecting shadow regions in an image as recited in claim 1, the steps further comprising, f) preprocessing said original image from an a red/green/blue RGB) color space into a normalized Log RGB space (see claim 1, also column 9, lines 58-64, refer to RGB color).

With regard to claims 5, 8, 10-11 and 15-16, the arguments analogous to those presented above for claims 1, 4, 7 and 8 are respectively applicable to claims 5, 6, 8, 10-11 and 15-16.

### **Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 13, is rejected under 35 U.S.C. 103(a) as being unpatentable over Paragios et al (U.S. patent 7,139,409) in view of Christopher Jaynes (Dynamic shadow removal from front projection displays).

However regarding claim 13, Paragios does not explicitly state its corresponding “removing at least one false shadow region from a list of detected shadow regions. On the other hand Christopher Jaynes in the same field of identifying shadow teaches (section 3. Shadow Detection Removal), in contrast with region based shadow removal in which rectangular region are either completely on or off)

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Paragios invention according to the teaching of Christopher Jaynes because it provides an system for effectively shadow regions, which can easily implemented in an imaging device such as CCD or computer vision.

### Allowable Subject Matter

5. Claims 9 and 12 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### Other prior art cited

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(U.S. patent 6,349,113) to Mech et al is cited for method for detecting moving cast shadows objects segmentation.

(U.S. patent 5,374,932) to Wyschogrod et al is cited for airport surveillance system.

(U.S. patent 6,775,014) to Foote et al is cited for system and method for determining the location of a target in a small area.

(U.S. patent 7,110,569) to Brodsky et al is cited for video based detection of fall-down and other events.

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(U.S. patent 6,208,417) to Itagaki et al is cited for method and apparatus for detecting minute irregularities on the surface of an object.

### ***Contact Information***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian  
Patent Examiner  
Group Art Unit 2624  
March 26, 2007

